

**REGULATION 9  
INORGANIC GASEOUS POLLUTANT  
RULE 6  
NITROGEN OXIDES EMISSIONS FROM  
NATURAL GAS-FIRED WATER HEATERS**

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**REGULATION 9**  
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**RULE 6**  
**NITROGEN OXIDES EMISSIONS FROM**  
**NATURAL GAS-FIRED WATER HEATERS**

(Adopted April 1, 1992)

**9-6-100 GENERAL**

**9-6-101 Description:** This rule limits the emissions of nitrogen oxides from natural gas-fired water heaters.

**9-6-110 Exemptions:** The requirements of Section 9-6-301 shall not apply to the following:

- 110.1 Natural gas-fired water heaters with an input rating of greater than 75,000 BTU per hour.
- 110.2 Natural gas-fired water heaters used in recreational vehicles.
- 110.3 Water heaters using a fuel other than natural gas.
- 110.4 Natural gas-fired water heaters used exclusively to heat swimming pools and hot tubs.

**9-6-200 DEFINITIONS**

**9-6-201 Natural Gas-Fired Water Heater:** A closed vessel, in which water is heated by the combustion of natural gas and is withdrawn for use external to the vessel at pressures not exceeding 160 psig, including the apparatus by which heat is generated and all controls and devices necessary to prevent water temperatures from exceeding 210°F.

**9-6-202 Natural Gas:** A mixture of gaseous hydrocarbons containing at least 80 percent methane by volume as determined according to Standard Method ASTM D1945-64.

**9-6-203 Heat Output:** The product obtained by multiplying the recovery efficiency, as defined by Section 6.1.3 of the Code of Federal Regulation, Title 10, Part 430, Subpart B, Appendix E, by the input rating of the water heater.

**9-6-204 Input Rating:** The amount of energy a water heater consumes in one hour (BTU/Hour).

**9-6-300 STANDARDS**

**9-6-301 Natural Gas-Fired Water Heaters with an Input Rating of 75,000 BTU/Hour or Less:** A person shall not sell, install, or offer for sale within the District any natural gas-fired water heater, manufactured after July 1, 1992, with an input rating of 75,000 BTU/Hour or less, that emits more than 40 nanograms of nitrogen oxides (calculated as NO<sub>2</sub>) per joule of heat output.

**9-6-302 Certification of Water Heaters:** Water heaters subject to Section 9-6-301 shall be certified in accordance with Sections 9-6-401, 402, and 403.

**9-6-400 ADMINISTRATIVE REQUIREMENTS**

**9-6-401 Certification:** The manufacturer shall demonstrate that each water heater model subject to the requirements of Section 9-6-301 has been tested in accordance with the following procedures:

401.1 The measurement of nitrogen oxides emissions shall be conducted in accordance with the Manual of Procedures, Volume IV, Method ST-13B or EPA Reference Method RM-7 (40 CFR Part 60, Appendix A, Test Method 7, including 7A-E).

401.2 Each tested water heater shall be operated in accordance with Section 2.4 of American National Standards ANSI Z21.10.1-1990 at normal test pressure,

input rates, and with a five-foot exhaust stack installed during the nitrogen oxides emissions tests.

- 401.3 The following procedure shall be used to calculate the NO<sub>x</sub> emission rate in nanograms of NO<sub>x</sub> per joule of heat output:

$$N = \frac{4.566 \times 10^4 \times P \times U}{H \times C \times E}$$

Where:

N = NO<sub>x</sub> Emission Rate in nanograms of NO<sub>x</sub> emitted per joule of heat output

P = Concentration of NO<sub>x</sub> in the flue gas in parts per million (volume)

U = Dry volume percent of CO<sub>2</sub> in flue gas necessary for stoichiometric combustion.

H = Gross heating value of the gas, BTU/Cu Ft (at 60 °F and 30"Hg)

C = Dry volume percent of CO<sub>2</sub> in flue gas

E = Recovery efficiency, percentage, as defined in Section 6.1.3 of the Code of Federal Regulation, Title 10, Part 430, Subpart B, Appendix E.

- 401.4 The manufacturer may submit to the District an approved SCAQMD certification in lieu of conducting duplicative certification tests.

**9-6-402 Compliance Statement:** Each manufacturer shall submit to the APCO a statement certifying that water heaters subject to this rule are in compliance with the provisions of Section 9-6-301. The statement shall be signed, dated, and attest to the accuracy of all information. The statement shall include the brand name, model number, and the input rating as it appears on the water heater rating plate. The manufacturer shall inform their wholesaler and/or retailer of the District's certification requirement.

**9-6-403 Identification:** The water heater manufacturer shall display the model number of a water heater complying with this rule on the shipping carton and on the rating plate of each unit.

## **9-6-600 MANUAL OF PROCEDURES**

**9-6-601 Determination of Emissions:** Emissions of oxides of nitrogen from water heaters subject to Section 9-6-301 shall be measured as prescribed in the Manual of Procedures, Volume IV, Section St-13B or EPA Reference Method RM-7 (40 CFR Part 60, Appendix A, Test Method 7, including 7A-E).